

kind above described which they may have at command. It is very desirable that the information should be received early in 1888, in order that the publication may not be unduly delayed.

Harvard College Observatory, Cambridge, U.S.A.:
1887, June 22.

On the Parallax of 61_1 and 61_2 Cygni, as obtained by the aid of Photography. By Professor C. Pritchard, D.D., F.R.S.

The computations for the parallax of the two components of this historical double star are now completed, subject to some possible slight revision of the numerical work.

Inasmuch as the present communication professes to be nothing more than a preliminary and provisional announcement, perhaps the most interesting form of making it may be to give a short citation from the Report of the astronomical work done at the University Observatory in Oxford during the past year. It will be seen in the sequel that it is not without some importance to add that the Report was approved and adopted by the Vice-Chancellor and other members of the Board of Visitors, including the Astronomer-Royal.

The following is the citation referred to:—

“The somewhat hazardous enterprise of attempting for the first time in the history of astronomy to obtain the distance of fixed stars from our earth by the aid of photography has been attended with success. The final results of the investigation have been placed in my hands only during the writing of this Report. The first observation was obtained on May 26 of last year, and the last was effected on May 31 of the present year. The intermediate computations were systematically continued during the interval. They involved the reduction of no less than 30,000 bisections of star-images, on 330 photographic plates, procured on 89 nights. Eight independent determinations of the parallax of the two components of 61 *Cygni* resulted from all this work, and these happily indicate a substantial agreement between themselves, and afford other necessary proof of reliability. Astronomical photography is hereby placed on a secure basis as an efficient and exact exponent of the highest form of astronomical science.

“Simultaneously with these observations similar work has been in progress for the determination of the parallax of μ *Cassiopeiae* and *Polaris*. These observations will now be treated on a less laborious scale. The photographic plates of the *Pleiades* have also been taken with the view of obtaining the accurate relative positions of about one hundred stars therein. The necessary triangulations have been commenced.

“The funds granted by the University have been sufficient notwithstanding the continuous activity, which requires a cor-

responding continuity of outlay. This grant, hitherto triennial, expires in December next. If the Board of Visitors see fit to request the University to continue this grant for five years, it would assist in enabling me to commence a valuable and extended class of work, which under other circumstances I should not be justified in attempting."

This last sentence was altered by the Board of Visitors into "to undertake for the University a share in the production of a photographic map of the heavens."

The details given above testify without further words of mine to the unwearied perseverance and intelligence of my two able assistants Mr. Plummer and Mr. Jenkins.

The following are the particulars of the final numerical results referred to in the foregoing citation:—

Parallax of 61₁ Cygni.

Parallax of 61₂ Cygni.

Determined from star $a = 0''.4294$

from star $a = 0''.4250$

$b = 0.4228$

$b = 0.4508$

$x = 0.4441$

$x = 0.4520$

$y = 0.4194$

$y = 0.4135$

Mean $= 0.4289$

Mean $= 0.4353$

Mean probable error of a single determination of

61₁ Cygni $= 0''.0136$.

61₂ Cygni $= 0''.0142$.

Mean distance of star a from $b = 2352''.20$

x from $y = 2066.16$

Distance a to b fluctuates from $2380''.84$ to $2382''.89$

x to y

2064.80 to 2066.86 .

Oxford University Observatory:
1887, June 10.

Postscript (June 24).—The very important significance of the above figures is twofold:

1. That in order to arrive at exactness of angular measure in a photograph, and especially in a series of photographs carried through considerable periods of time, it is absolutely necessary that each plate should be considered as carrying with it its own scale, which scale may be slightly variable from night to night, or even during the same night. This fact is indicated by the small variations in the distances of the comparison stars a , b , and x , y from each other. This fact, however, is not peculiar to photographic plates, but exists (to a less extent) even in measures taken with the heliometer.

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2. That if due regard be had to this slight variation of scale, photography, properly handled, gives reliable results, equal in accuracy and delicacy to those obtainable by any other known astronomical methods.

Since the writing of the foregoing very succinct and provisional account of work recently completed at the University Observatory, Dr. De la Rue, with that munificent generosity which he has so often exercised for the promotion of knowledge, has promised the pecuniary means of adding a photographic telescope or camera to the large Refractor in that institution. The condition attached to this gift is the compliance of the University with the request made, as above stated, by the Board of Visitors. Oxford, therefore, may now be expected to be associated with Greenwich in the production of the great international photographic chart of the heavens projected at the Paris Conference.

A Comparison of the Star-Places of the Argentine General Catalogue for 1875 with those of the Cape Catalogue for 1880, and with those of other Southern Star Catalogues. By A. M. W. Downing, M.A.

In making this comparison the places of those stars which are common to the Argentine General Catalogue and the Cape Catalogue for 1880, as given in the former, have been brought up from 1875 to 1880, and the differences, Cordoba—Cape, taken. Proper motion has been applied in forming both the Cordoba mean places for 1875 and the annual variations in all those cases in which a proper motion is given in the Cape Catalogue, the quantity of proper motion being taken from the latter. The mean epochs of the two Catalogues are, however, so nearly identical that this element can have no sensible effect on the result deduced from such a large number of stars as is the present. In combining the separate differences, formed as is explained above, each hour of R.A. has been taken by itself, and the stars occurring in each hour arranged in order of N.P.D., and then the means taken over zones 10° wide for the extremes, 90° — 100° , 100° — 110° , and 170° — 180° , and 5° wide for intermediate N.P.D.s. In this manner the table (Table I.) has been formed, exhibiting the values of Cordoba—Cape, both for R.A. and N.P.D., corresponding to each hour of R.A. and to each zone of N.P.D., and the number of stars (always the same for $\Delta\alpha$ and $\Delta\delta$) in each group. It will of course be understood that the R.A.s of these two Catalogues depend on different systems of time-stars. In the formation of the Argentine Catalogue the star-places of the *American Ephemeris* for the different years were used; the Cape R.A.s depend on the annual lists of fundamental stars issued from the Greenwich Observatory.